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10/568,484	09/22/2006	Elio Marioni	7202-107 (182153)	2278

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EXAMINER	
BOBISH, CHRISTOPHER S	
ART UNIT	PAPER NUMBER
3746	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,484	MARIONI, ELIO	
	Examiner	Art Unit	
	CHRISTOPHER BOBISH	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The response filed on 04/16/2009 under 37 CFR 1.131 is sufficient to overcome the Batchelder and Marioni references as previously applied; however a new rejection has been made using these references.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable

over U.S. Patent 6,390,780 to Batchelder et al. (Batchelder et al.) in view of U.S. Patent 5,434,491 to Marioni (Marioni) in view of Kalb et al (US Patent No. 6,710,562).

In Reference to Claim 1

Batchelder et al. teach an electronic driving device for turning on and off a pump comprising an electric motor with a permanent-magnet rotor (see abstract), comprising:

at least a static power switch (trigger circuit (90) serves as a switch) inserted in series between the motor (12) and an electric power supply source (DC battery, see column 7 lines 57-61); and

a processing unit (PCB unit (58)) having at least an input receiving a synchronism signal (reference circuit (94) receives a supply voltage V2 and a ground voltage) and a control output connected to said switch (see figure 11);

wherein the electronic driving device is enabled by a signal emitted by a float level sensor (float assembly (40) and reed switch (42)) and includes an input receiving a signal by a position sensor detecting the rotor polarity and position (sensor (104) is used to detect the load on the motor, which could be used to derive the rotor's position and polarity);

wherein the pump turn-on and off is regulated according to the signal emitted by said level sensor (The pump is turned on based on a signal from the float sensor, while the pump is turned off based on a detected load of the pump motor, see columns 9-10 lines 61-12).

Batchelder et al. fail to teach that the motor is a synchronous motor and is driven by an alternating current power source.

Marioni teaches a synchronous motor device, see figures 1 and 2, where the motor attains synchronized speeds very quickly (see column 1 lines 40-45). It would have been obvious to one of ordinary skill in the art at the time of invention to use the motor of Marioni to drive the pump of Batchelder et al. since synchronized pumps do not have any motor slip, and since they are known to be effective in applications where large amounts of horsepower are required at lower speeds, much as the bilge and sump applications described by Batchelder et al. Since the motor of Marioni is a synchronous motor, it would necessarily be run off of an alternating current power supply.

Neither Batchelder nor Marioni teaches a comparison of two load angle values to control the motor, but Kalb does (note that Batchelder uses load as a pump-off determining condition).

Kalb teaches a synchronous motor device (FIG. 1) wherein the differences between measured (current) and maximum load angles are used to determine a synchronous motor condition to control the on/off of the motor (see C. 3 Line 49 to C. 4 Line 20); and a sensor (50) providing input to the device (C. 3 Lines 38-41 and C. 6 Lines 12-18, the sensor detects rotor position and direction which relate to polarity); It would have been obvious to one of ordinary skill in the art of synchronous motors at the time of the invention to substitute the load angle comparison method as taught by Kalb for the load monitoring method of the synchronous device taught by Batchelder and modified by Marioni in order to safely and accurately control the synchronous type device.

In reference to Claim 2

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above); Kalb further teaches wherein said position sensor is a Hall-effect sensor (see C. 1 Lines 30-33 regarding the use of hall sensors on motor assemblies);

In reference to Claim 3

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above); Kalb further teaches wherein the motor comprises rotor poles (rotor 1b will have opposing poles) divided by an ideal plane whose rest position is orthogonal to the position of the sensor (50, see FIG. 1);

In reference to Claim 5

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above); Batchelder further teaches wherein the float of said level sensor is incorporated in an envelope (the float (40) of Batchelder et al. in enveloped in a compartment (41)), externally associated with the body of the pump (the compartment is located outside of the pump chamber inside of nozzle case (22)) and the sensor element of said level sensor is housed in the pump body in correspondence with said float (the sensor's magnet (46) is located in the housing in the float).

In Reference to Claim 6

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above); Batchelder further teaches wherein said float (Batchelder et al. (40)) is equipped in its lower part with a permanent magnet (The magnet (46) extends into the lower portion of the float).

In Reference to Claim 7

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above); Batchelder further teaches wherein said pump is an immersion pump (the pump is meant to be submerged in a tank, see column 1 lines 8-25 of Batchelder et al.).

In Reference to Claim 8

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above); Batchelder further teaches wherein said electronic device is housed on an electronic board (PCB (58)) positioned inside the pump body in a position just underlying the float level sensor (see figure 8, where the PCB (58) is located just below the reed switch (42) portion of the float sensor).

In Reference to Claims 10 and 12

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above); Kalb further teaches wherein the synchronous device is tuned off if the value of a counter is greater than a predetermined

time limit defined for an emergency stop; and wherein a time counter is incremented while a float level sensor is low (low float level from Batchelder indicating shutoff level would correspond to a shutoff load in Kalb) and the pump is off to check the inactivity time period of the device and turn it on for a predetermined time period (see C. 4 Lines 1-20);

In Reference to Claim 11

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above); Kalb further teaches wherein said critical load is a mean value among sampled values (C. 3 Lines 49-55 and C. 4 Lines 39-51);

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder et al. in view of Marioni in view of Kalb et al (US Patent No. 6,710,562), and in further view of U.S. Patent 6,452,202 to Eom (Eom).

In Reference to Claim 4

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above), but do not teach that the float level sensor comprises a Hall probe.

Eom teaches an apparatus for measuring the level of liquid in a tank where a float (15) and a Hall sensor that responds to a magnetic force is used to measure the positional displacement of the float (see column 2 lines 41-46). It would have been obvious to one of ordinary skill in the art at the time of invention to use a Hall sensor to sense the position of the float of Batchelder et al. as taught by Eom in order to give a more precise measure of the float's position.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder et al. in view of Marioni in view of Kalb et al (US Patent No. 6,710,562), and in further view of U.S. PGPub No. 2003/0076068 to Pollock et al (Pollack).

In Reference to Claim 9

Batchelder et al. as modified by Marioni and Kalb teach the device according to claim 1 (see the rejection of claim 1 above), but do not teach using back emf in the load angle calculation.

Pollack teaches that rotor position, emf and load angle are all related as it pertains to synchronous motors and that load angle can be determined from measurements of these values (Page 1 paragraph 0007). There are many known methods of detecting load angle using similar measured values, choosing one method from the others would be an obvious choice to one of ordinary skill in the art.

Response to Arguments

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(US Patent No. 3,525,913) to Huggett discloses protecting a synchronous pump by shutting down the pump based on critical load angle values.

(US Patent No. 4,099,103) to Seeger et al discloses using load angle as the input to a control of a synchronous motor.

(US Patent No. 6,146,109) to Davis et al discloses a method of detecting a critical pumping situation based on a comparison between a difference of two detected values and a stored value.

(US Patent No. 6,566,829) to Naidu et al and (US Patent No. 6,194,852) to Lovatt et al disclose the relationships between load angle, back-emf, current and voltage.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER BOBISH whose telephone number is (571)270-5289. The examiner can normally be reached on Monday through Thursday, 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571)272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Bobish/
Examiner, Art Unit 3746

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

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